

REMARKS

Status of the Claims

Currently Amended: Claims 1, 14, 17, 19, and 22

Original: Claims 2-13, 15, and 23-32

Cancelled: Claims 16, 18, 20, and 21

Claims 1-15, 17, 19, and 23-32 are pending in the present application. Applicant has amended claims 1, 14, and 22 to more clearly define the present invention.

Objections to the Specification

The Examiner has objected to the use of various trademarks and other informalities throughout the specification. The Examiner has noted that the objections to the specification as set forth in paragraphs 4-7 of the Official Action would be withdrawn once the amendments of December 29, 2003 have been properly entered into the substitute specification with the exception of an informality regarding reference number 158.

Pursuant to MPEP § 608.01(q) and 37 CFR 1.125(a), Applicant respectfully submits for examination the enclosed substitute specification. Applicant is submitting the substitute specification which includes corrections to the text based on the amendments of December 29, 2003. Applicant has further amended the specification to include a reference in the text to reference number 158 in Fig. 4.

Applicant is submitting a substitute specification rather than an amendment because the number and nature of the amendments would render it difficult for the Examiner to consider the application. The substitute specification includes no new

matter. Enclosed is a marked up version of the substitute specification showing all the changes including the new change regarding reference number 158 in Fig. 4. Also enclosed is a clean form version of the substitute specification without markings as to amended material. Applicant respectfully submits that the substitute specification overcomes the Examiner's objections noted in paragraphs 4-7 of the Official Action.

Claim Rejections Under 35 U.S.C. § 103

The Examiner has rejected claims 1-32 under 35 U.S.C. § 103(a) as being unpatentable over Elliot in view of either Cornwell, Heng, or Kumagai. It is the Examiner's position that Elliot discloses a CAD system in which a user connects via a network to a centralized computer system and databases and that the user views and designs an item via a series of guiding menus for the selection of various forms/components and associated functions of the selected forms/components. It is the Examiner's position that Elliot does not teach evaluating design feasibility, and that Cornwell, Heng, or Kumagai disclose CAD systems that permit a user to modify the design of a product within various design constraints (e.g., size, manufacturability). The Examiner states that it would have been obvious to one of ordinary skill at the time of the invention to modify the CAD system of Elliot to consider and display the feasibility of a design as taught by Cornwell, Heng, or Kumagai. The Examiner has further stated that it would be inherent to one of ordinary skill that when the CAD system of Cornwell, Heng, or Kumagai that permits the user to modify the design of a product within various design constraints, the size, manufacturability, and compatibility of the selected components for performing the desired useful result are checked because a design that

is not compatible or operative for the desired results would not be desirable by one of ordinary skill in the art or the customer for which the design is generated. Finally, the Examiner has stated that neither the claims nor teachings of the prior art preclude some claim limitations to be performed manually or with the aid of a computer and that the claims are broad enough to include the claim limitations in a manual and an automatic manner.

Applicant respectfully submits that the Examiner's reliance on references related to the construction industry is misplaced. Further, Applicant has amended claims 1, 14, and 22 to indicate that design feasibility according to the present invention relates to functional as well as physical compatibility between the functional modules selected by the user and to indicate that design compatibility or feasibility is determined by a computer as a user makes component selections for a design. In view of Applicant's amended claims and the Examiner's reliance on references from the construction industry, Applicant respectfully traverses the rejections.

The primary reference relied upon by the Examiner, Elliot, discloses creation and modification of a graphical image of a house based on a user's selections of materials to use in building the house. The reference relates only to the construction industry. Applicant respectfully submits that the Examiner's reliance on the Elliot reference is misplaced because CAD systems for construction projects are non-analogous art to the electronics industry. Applicant respectfully submits that it is unlikely that an electronics engineer would consider CAD systems for specifying the physical layout of items in a construction project relevant to a system for designing a circuit board. As suggested in MPEP 2141.01, even references that relate to memory modules, a type of electronic

component, are not considered analogous prior art when used for different applications. Applicant respectfully submits that if references directed to electronic components used in different applications are non-analogous, a reference unrelated in any way to design of circuit boards is non-analogous prior art that cannot be properly applied to the present invention which is directed to design of circuit boards.

Furthermore, contrary to the Examiner's assertion, the Elliot reference does not disclose or teach form factors or functional modules as taught by Applicant. Each of Applicant's independent claims has a limitation related to a "form factor" and "functional module." The terms "form factor" and "functional module" have special meaning in the electronics industry. Therefore, the pending claims relate to the electronics industry and are simply not broad enough to cover selection of building materials for a house or construction project. Applicant respectfully submits therefore, that the Elliot reference does not contain the teachings with respect to the present invention as asserted by the Examiner and therefore, cannot be combined with other references to support the present rejections.

It is the Examiner's position that the deficiencies of Elliot are that Elliot does not teach evaluation of design feasibility nor does it apply to circuit boards. Applicant respectfully submits that the Elliot reference is deficient not only for the reasons cited by the Examiner. It is further deficient because it relates only to the physical characteristics or appearance of a house. In Elliot, a graphical image is updated as the user makes selections related to the appearance of the house. The user's options relate to materials to be used in construction of the house and do not relate in any way to the functional aspects of the materials. Elliot teaches that the user may select

“materials that have a considerable effect on the overall aesthetics of the house, such as carpeting, tile, wall, paper, trim, aluminum siding, and exposed brick.” (Col. 8, l. 66 – Col. 9, l. 2). There is no indication that functional aspects of the materials are even defined so that they could be considered in any feasibility or compatibility analysis. Therefore, there is no teaching in Elliot that relates in any way to functional as well as physical attributes of form factors and functional modules as set forth in Applicant’s amended claims.

Applicant respectfully submits that the Cornwell, Heng, and Kumagai references relied on by the Examiner cannot fulfill the deficiencies of Elliot. Cornwell also relates the construction industry and for the reasons noted with respect to the Elliot reference, is non-analogous prior art. Furthermore, Cornwell teaches evaluating designs for cabinets according to physical constraints. Cornwell specifically states that the computer creates a graphical image of an initial cabinet layout and that the user may alter the placement of cabinets presented by the computer. The system supports the adjustment of placement and appearance of cabinets and is directed to designing and detailing cabinets to fit within an available space. (Col. 2, l. 64 – Col. 3, l. 22). The only design constraints that are considered are physical and relate to placement of the cabinets in the allotted space. The combination of the Elliot and Cornwell references simply indicate that a user may review a graphical image of a construction project. Cornwell does not teach or even suggest associating physical and functional attributes with components nor evaluating the functional as well as physical aspects of a design. Therefore, it does not fulfill the deficiency of the Elliot reference. Applicant respectfully

submits therefore, that the Cornwell reference when combined with the Elliot reference cannot support the present rejections.

Although the other two references, Kumagai and Heng, discuss circuit design, Applicant respectfully submits that neither reference teaches or even suggests associating physical and functional attributes with components nor evaluating functional as well as physical feasibility or compatibility as a user makes component selections for a circuit board design. Therefore, neither reference can be combined with Elliot to support the present rejections. Kumagai discusses evaluation but the evaluation relates to the assembly and production of the circuit board. For one embodiment of the invention, Kumagai specifically states that "circuit design and the components selection are executed based on a system design specification, in the same way as in the conventional art." (Col. 17, ll. 53-57). There is no other indication in the reference that the process of component selection is changed in any way. In other words, components are not selected using an interactive system, and there is no evaluation of component selections for functional compatibility as the user makes them. Even if Kumagai could be combined with Elliot, the result is a system in which evaluation as it relates to assembly and production is performed after component selection. The user would be informed only of assembly or production problems following completion of the design. Neither reference teaches or even suggests evaluating a design for functional or compatibility problems. It is not clear from either teaching how such an evaluation of functional or compatibility problems could be performed. Furthermore, neither reference teaches or even suggests evaluating a design during component selection, before the design is complete. Applicant respectfully submits therefore, that the Kumagai

reference does not fulfill the deficiencies of Elliot and cannot be combined with Elliot to support the present rejections.

Heng also relates to physical design constraints and use of a phase-shift migration tool to evaluate designs. In Col. 6, ll. 41-45, Heng states that the tool uses phase shift design rule checking and layout modification system technology to isolate and resolve phase shift in compliant shapes and layouts with minimized impact on layout density. As in Kumagai, any evaluation that is performed occurs after the design is complete. It is not clear from the teaching how an evaluation of functional or compatibility problems could be performed. Furthermore, as in Kumagai, any evaluation occurs on a completed design. There is no suggestion or teaching related to evaluation of design feasibility as the user selects components. Even if Heng could be combined with Elliot, the result is a system in which evaluation as it relates to layout is performed after all of the components have been selected. Applicant respectfully submits therefore, that the Heng reference does not fulfill the deficiencies of Elliot and cannot be combined with Elliot to support the present rejections.

Applicant's amended claims indicate clearly that a computer considers functional as well as physical attributes of components as they are selected by a user in order to evaluate design feasibility during the automated design process. Because feasibility is considered at every step, rather than on a completed design and only for physical characteristics as taught by the prior art, the resulting design is known to be operable. None of the prior art references even suggest associating functional attributes with components and evaluating functional compatibility between selected components based on the attributes. It would not be clear how one skilled in the art could possibly

modify the prior art teachings to arrive at design feasibility based on functional as well as physical attributes as a user makes component selections using a computer because none of the references teach or even suggest considering functional attributes of components. Although the benefits of evaluating design feasibility may be obvious (as noted by the Examiner eliminating incompatible or inoperative designs), the cited references are not sufficient to teach or even suggest to one of ordinary skill in the art how to implement such a system or method.

Applicant respectfully submits that the present application is now in condition for allowance and respectfully requests such action. Upon consideration of this response, Applicant respectfully requests that the Examiner contact Applicant's representative by telephone or email to schedule a telephone interview to discuss the present application.

Respectfully submitted,

Date: June 2, 2004 By: Carol G. Stovsky
Carol G. Stovsky
Reg. No. 42,171
Standley Law Group LLP
495 Metro Place South, Suite 210
Dublin, Ohio 43017
Tel.: 614-792-5555
Fax: 614-792-5536
cstovsky@standleyllp.com

Application Serial No.: 09/589,222

Group Art Unit: 3629

Application Filing Date: June 7, 2000

Application Title: SINGLE BOARD COMPUTER QUOTATION AND DESIGN
SYSTEM AND METHOD

CLEAN VERSION OF SUBSTITUTE SPECIFICATION